REMARKS

Claim Changes

Claims 1-2, 12-19, 22-24, and 27-28 have been cancelled without prejudice or disclaimer.

Claim 20 is amended to recite "a predictor to extract cross-subband dependence from the down sampled signal." This change is based at least on FIG. 11 and the accompanying description on page 12, lines 20-22 of the specification as filed. Thus, no new matter is added. Claim 20 is further amended to clarify and simplify the language.

Claim 3 is amended to change its dependency.

Claim 4, 5, 9, and 11 are amended to be consistent with claim 20. Claim 4 is further amended to correct a typographical error.

Claim 6-8 are amended to overcome the claim objections.

Claim 25, 29, and 31 are amended to clarify and simplify the language.

Claim 33 is amended to more clearly recite the claimed invention. Support for the changes can be found on page 10, lines 14-18 of the specification as filed. Thus, no new matter is added.

No amendment made is related to the statutory requirements of patentability unless expressly stated herein. No amendment is made for the purpose of narrowing the scope of any claim, unless Applicant had argued herein that such amendment is made to distinguish over a particular reference or combination of references. Any remarks made herein with respect to a given claim or amendment is intended only in the context of that specific claim or amendment, and should not be applied to other claims, amendments, or aspects of Applicant's invention.

Objection to the Claims

In response to the objection to claims 6, 7, and 8 for informalities, Applicant has reworded "a predictor" to "the predictor" for clarity as requested.

Rejection of claims 1-7 and 20 under 35 U.S.C. § 102(b) as being anticipated by US 5,883,978 (Ono)

Applicant has amended independent claim 20 to clarify the invention and Applicant has cancelled claims 1 and 2. Applicant therefore respectfully requests reconsideration of the rejection of claims 3-7 and 20 under 35 U.S.C. § 102(b) as being anticipated by Ono as herein amended.

Applicant respectfully submits that Ono does not anticipate, either expressly or inherently, each and every element as set forth in independent claim 20 as amended. Specifically, independent claim 20 recites "a compressor including a quantizer and coder for reducing the amount of down sampled data only from second and higher levels of wavelet decomposition" which is not anticipated either expressly or inherently, in Ono.

Ono is directed to an image compressing method using wavelet decomposition to decompose the input signal into a plurality of subbands. See Ono, column 6, lines 25-26. In Ono, at the transmitter end, the coefficients of higher frequency subbands are predicted from the coefficients of lower frequency subbands by a predictor and the difference between the predicted coefficients and the actual coefficients is stored in a subtraction result memory. See Ono, column 7, lines 15-21 and lines 51-61. A quantizing unit in Ono quantizes the coefficients stored in the subtraction result memory and a variable length coding unit compresses the quantized data. See Ono, column 9, lines 5-10.

In contrast, Applicant states "a compressor including a quantizer and coder for reducing the amount of down sampled data only from second and higher levels of wavelet decomposition" that is not taught by Ono. Applicant respectfully submits that Applicant's compressor uses only the second and higher levels of wavelet decomposition to produce a compressed output, whereas Ono's quantizing unit and variable length coding unit uses coefficients of lower frequency subbands and

subtraction results of coefficients of higher frequency subbands and predicted value of coefficients of the higher frequency subbands to produce a compressed output. Moreover, as Applicant's compressor uses less amount of data to produce a compressed output, the compressed output of Applicant's encoder has less bits per pixel as compared to the compressed output of Ono's encoder. Therefore, less amount of data needs to be transmitted and Applicant's bit rate efficiency is high as compared to Ono. See page 7, lines 5-22 and page 14, lines 12-16 of the Applicant's original specification. Nowhere does Ono shows or suggest "a compressor including a quantizer and coder for reducing the amount of down sampled data <u>only from second and higher levels</u> of wavelet decomposition" as required by independent claim 20, as amended.

In view of the foregoing, Applicant respectfully submits that Ono does not disclose "a compressor for reducing the amount of data only from second and higher levels of wavelet decomposition." Applicant therefore submits that claim 20 is not anticipated by Ono, and therefore the rejection of claim 20 under 35 USC § 102(b) should be withdrawn. Applicant requests that claim 20 may now be passed to allowance.

Dependent claims 3-7 depend from, and include all the limitations of independent claim 20. Therefore, Applicant respectfully requests reconsideration of dependent claims 3-7 and requests the withdrawal of the rejection.

<u>Rejection of Claims 21-27, 29, 30, and 33 under 35 U.S.C. § 103 (a) as being unpatentable over US 5,883,978 (Ono)</u>

Applicant has amended the claims to clarify the invention. Applicant has also cancelled claims 22-24 and 27. Applicant therefore respectfully requests reconsideration of the rejection of claims 25, 26, 29, 30, and 33 under 35 U.S.C. § 103(a) as being unpatentable over Ono as herein amended.

Regarding independent claims 25 and 29, the Office Action on page 7 and 9 states that "Ono teaches an encoder that mirrors the decoder of claim [25 and 29]." Applicant respectfully submits that Ono does not teach or suggest an encoder that mirrors the decoder of independent

claims 25 and 29. As explained earlier, Ono describes an encoder that includes a quantizing unit and a coding unit. Ono's encoder reduces the amount of down sampled data from the higher level of wavelet decomposition and the difference between the actual and predicted coefficients of the lower level of wavelet decomposition. However, Applicant's quantizer and coder reduce the amount of down sampled data <u>only from second and higher levels of wavelet decomposition</u>. As a result, Ono's encoder (quantizing unit and variable length coding unit) are different from Applicant's encoder (quantizer and coder). Thus, Ono does not teach or suggest an encoder that mirrors Applicant's decoder of claims 25 and 29. Thus, the application of Ono should be withdrawn.

Furthermore, Applicant respectfully submits that Ono does not teach or suggest all the claim limitations as set forth in independent claim 33 as amended. Specifically, independent claim 33 requires "a quantizer for processing <u>only subbands from the second and higher levels</u> of wavelet decomposition" and "a coder for compressing <u>only the subbands from second and higher levels</u> of wavelet decomposition," as amended. As explained above, Ono's quantizing unit and variable length coder reduces the amount of down sampled data from the higher level of wavelet decomposition and the difference between the actual and predicted coefficients of the lower level of wavelet decomposition. However, Applicant's quantizer and coder reduce the amount of down sampled data <u>only from second and higher levels of wavelet decomposition</u>. Therefore, Ono does not teach or suggest "a quantizer for processing <u>only subbands from the second and higher levels</u> of wavelet decomposition" and "a coder for compressing <u>only the subbands from second and higher levels</u> of wavelet decomposition," as required by independent claim 33. Thus, the application of Ono should be withdrawn.

In view of the foregoing, Applicant therefore submits that independent claims 25, 29, and 33 are not anticipated by Ono, and therefore the rejection of claims 25, 29, and 33 under 35 § 103 (a) should be withdrawn. Applicant requests that claims 25, 29, and 33 may now be passed to allowance.

Dependent claims 26 and 30 depend from, and include all the limitations of independent claims 25 and 26. Therefore, Applicant respectfully requests reconsideration of dependent claims 26 and 30, and requests the withdrawal of the rejection.

Rejection of Claims 8-19, 28, 31, and 32 under 35 U.S.C. § 103 (a) as being unpatentable over US
5,883,978 (Ono) in view of "Multirate Systems and Filterbanks" (Vaidyanathan)

Applicant has amended the claims to clarify the invention. Applicant has also cancelled
claims 12-19, and 28. Applicant therefore respectfully requests reconsideration of the rejection of
claims 8-11, 31, and 32 under 35 U.S.C. § 103(a) as being unpatentable over Ono in view of
Vaidyanathan as herein amended.

Applicant respectfully submits that the combination of Ono and Vaidyanathan does not
teach or suggest all the claim limitations as set forth in independent claim 31. Specifically,
independent claim 31 requires "a plurality of partial interpolators for partially upsampling the
extracted data from the predictor" which is not taught or suggested by the combination of Ono and
Vaidyanathan.

Applicant respectfully disagrees with the statement on page 21 of the Office Action that
states "[Regarding claim 31] a plurality of partial interpolators for partially upsampling the
extracted data from the predictor (see Vaidyanathan, p. 140, FIG. 4.4-5(b), decimation is
performed in two stages, before and after a function, which mirrors upsampling)." This analogy is,
however, a mischaracterization of Vaidyanathan.

Vaidyanathan is directed to a multistage design of decimation and interpolation filters. In
FIG. 4.4-5(b) on page 140, Vaidyanathan describes performing down sampling in two stages
before and after a filter and thus, it mirrors performing upsampling in two stages before and after a
filter. However, Applicant discloses performing partial upsampling after a predictor. Applicant's
predictor is not a filter. For example, the prediction can be done by averaging the coefficients, or
by using the same value of the coefficients, or by adjusting dc level of the coefficients. Thus,
Vaidyanathan teaches performing partial upsampling after a filter. Therefore, Vaidyanathan does
not teach or suggest "a plurality of partial interpolators for partially upsampling the extracted data
from the predictor" as required by independent claim 31. Thus, the application of Vaidyanathan
should be withdrawn.

Further, Applicant respectfully disagrees with the statement on pages 13 and 14, of the Office Action regarding claims 8 and 10 that "Vaidyanathan teaches that <u>full decimation is performed after the predictor</u> to minimize spatial location variance introduced by decimation (See Vaidyanathan, p. 119, FIG.4.2-3, Identity 1, decimation is preformed after a rational function)." This analogy is, however, a mischaracterization of Vaidyanathan. As, in FIG. 4.2-3, Identity 1 on page 119, Vaidyanathan describes performing down sampling after <u>a filter</u> whereas, Applicant discloses performing down sampling after a <u>predictor</u>. As explained above, Applicant's <u>predictor is not a filter</u>. For example, the prediction can be done by averaging the coefficients, or by using the same value of the coefficients, or by adjusting dc level of the coefficients. Therefore, Vaidyanathan does not teach or suggest "full decimation is performed <u>after the predictor</u> to minimize spatial location variance introduced by decimation" as required by dependent claims 8 and 10. Thus, the application of Vaidyanathan should be withdrawn.

Further, Applicant respectfully disagrees with the statement on page 13, 14, and 15, of the Office Action regarding claim 9 and 11 that "Vaidyanathan teaches that partial decimation is performed <u>after both the multi-level analysis filter bank and the predictor</u> for reducing the number of computations by the multi-level analysis filter bank and decimation (See Vaidyanathan, p. 119, FIG.4.2-3, Identity 1, decimation is preformed in two stages, before and after a function)." This analogy is, however, a mischaracterization of Vaidyanathan. As, in FIG. 4.4-5(b) on page 140, Vaidyanathan describes performing down sampling in two stages before and after <u>a filter</u> whereas, Applicant discloses performing partial down sampling after a <u>predictor</u>. Applicant's <u>predictor is not a filter</u>. Therefore, Vaidyanathan does not teach or suggest "partial decimation is performed <u>after both the multi-level analysis filter bank and the predictor</u> for reducing the number of computations by the multi-level analysis filter bank and decimation" as required by dependent claims 9 and 11.

Moreover dependent claims 8-11 depend upon independent claim 20. Ono has been previously discussed and it has been clarified that Ono does not show or suggest "a compressor including a quantizer and coder for reducing the amount of down sampled data only from second and higher levels of wavelet decomposition" as recited in independent claim 20. Vaidyanathan fails to overcome the deficiency of Ono in that Vaidyanathan also does not show or suggest the

above-mentioned limitation. Therefore, the combination of Ono and Vaidyanathan fails to show or suggest "a compressor including a quantizer and coder for reducing the amount of down sampled data only from second and higher levels of wavelet decomposition" as recited by independent claim 20. Claims 8-11 depend on independent claim 20 and thus are not unpatentable over Ono and Vaidyanathan.

For the above reasons, Applicant submits that claims 8-11 and 31 are not obvious in view of the combination of Ono and Vaidyanathan, and therefore that the rejection of claims 8-11 and 31 under 35 USC § 103 (a) should be withdrawn. Applicant requests that claims 8-11 and 31 now be passed to allowance.

Dependent claim 32 depends from, and includes all the limitations of independent claim 31. Therefore, Applicant respectfully requests the reconsideration of dependent claim 32 and requests withdrawal of the rejection.

Conclusion

Applicant respectfully requests that a timely Notice of Allowance be issued in this case. Such action is earnestly solicited by the Applicant. Should the Examiner have any questions, comments, or suggestions, the Examiner is invited to contact the Applicant's attorney or agent at the telephone number indicated below.

Please charge any fees that may be due to Deposit Account 502117, Motorola, Inc.

Respectfully submitted,

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